



**MÜLLER SCHUPFNER**

P A T E N T A N W Ä L T E

Bavariaring 11  
D-80336 München

Telefon: + 49-89-21 99 12 0  
Telefax: + 49-89-21 99 12 20  
E-mail: maximark@propat.de

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European Patent Attorneys  
European Trade Mark Attorneys  
European Design Attorneys

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P R O P A T<sup>®</sup>

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Ferton Holding S.A.

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### Claims

1. A Nozzle piece for a dental powder jet apparatus provided for an exchangeable assembly on a hand piece and having a discharge nozzle for discharging a mixture of air and a dental powder suitable for cleaning teeth, wherein a front partial length at the outlet cross section of the discharge nozzle projects over a grip of the nozzle piece connected to the hand piece towards the outside and has the shape of a tube,

**characterized in that**

the outlet cross section of the discharge nozzle comprises a few nozzle openings in the lateral area of the front end of the tube-shaped partial length of the nozzle piece.

2. The nozzle piece of claim 1,

**characterized in that**

the nozzle openings are arranged in a common radial plane of the tube and are spaced in regular distances or in varying distances along the corresponding circumference of the tube.

3. The nozzle piece of claim 1,

**characterized in that**

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the nozzle openings are arranged in at least two different radial planes of the tube and in that the nozzle openings in one radial plane are twisted with respect to the nozzle openings in the other radial plane in the circumferential direction of the tube.

4. The nozzle piece according to one of claims 1 - 3,  
**characterized in that**  
the nozzle openings are formed as radial passages.

5. The nozzle piece according to one of claims 1 - 4,  
**characterized in that**  
the nozzle openings are formed as beveled passages, forming an acute angle with the axis of the tube.

6. The nozzle piece according to one of claims 1 - 4,  
**characterized in that**  
the nozzle openings are formed as tangentially oriented or skewed passages.

7. The nozzle piece of claim 6,  
**characterized in that**  
the axes of the tangential or skewed passages are oriented in an acute angle to the axial plane of a tube.

8. The nozzle piece according to claim 5 or 6,  
**characterized in that**  
the outlet cross sections of the beveled passages and/or the tangential or skewed passages are disposed downstream of the corresponding inlet cross sections of the passages.

9. The nozzle piece of claim 6,

**characterized in that**

the axes of the tangential or skewed passages run in a common radial plane of a tube.

10. The nozzle piece of one of claim 1 - 9,

**characterized in that**

the nozzle openings are elongated or slot-shaped.

11. The nozzle piece according to claim 10,

**characterized in that**

a defined longitudinal axes of the slot-shaped nozzle openings is parallel to the main axis of the tube or forms an angle to a lateral area of the tube.

12. The nozzle piece according to one of claims 1 - 11,

**characterized in that**

in one or each of the radial planes of the tube, at least three nozzle openings are disposed along the corresponding circumference of the tube.

13. The nozzle piece according to one of claims 1 - 12,

**characterized in that**

the front end of the tube is either closed or provided with an axial nozzle opening.

14. The nozzle piece according to claim 13,

**characterized in that**

the axial nozzle opening is diffuser-shaped.

15. The nozzle piece according to claim 13,

**characterized in that**

the axial nozzle opening is shaped in the style of a venturi nozzle.

16. The nozzle piece of claim 13,

**characterized in that**

the axial nozzle opening is provided with an outlet cross section which narrows in the axial direction.

17. The nozzle piece of claim 13,

**characterized in that**

the axial nozzle opening is asymmetrically formed in order to deflect the discharged air-powder-mixture jet from the axis of the tube.

18. The nozzle piece of one of claims 13 - 16,

**characterized in that**

a deflection body is provided at the axial nozzle opening, the deflection body directing the discharged air-powder-mixture jet against the treated tooth surface.

19. The nozzle piece according to claim 18,

**characterized in that**

the deflection body is interchangeably mounted on the tube.

20. The nozzle piece according to one of claims 1 - 19,

**characterized in that,**

in addition to the discharge nozzle for the air-powder-mixture, a fluid discharge nozzle is provided, having a mouth which is axially displaced backwards with respect to the nozzle openings of the discharge nozzle for the air-powder-mixture.

21. The nozzle piece according to claim 20,

**characterized in that**

the fluid discharge nozzle is concentrically arranged to the discharge nozzle for the air-powder-mixture.

22. The nozzle piece according to claim 21,

**characterized in that**

the fluid discharge nozzle is provided with a diffuser-shaped outlet cross section.

23. The nozzle piece according to claim 20,

**characterized in that**

the fluid discharge nozzle is disposed on one side of the discharge nozzle for the air-powder-mixture.

24. The nozzle piece according to one of claims 1 - 23,

**characterized in that**

the tube-shaped partial length of the nozzle piece has an arched shape ending at the nozzle openings of the discharge nozzle.

25. The nozzle piece according to one of claims 1 - 24,

**characterized in that**

the tube-shaped partial length of the nozzle piece has an oval to elliptic cross section.

26. The nozzle piece according to one of claims 1 - 25,

**characterized in that**

the tube-shaped partial length of the nozzle piece is made of a material behaving atraumatically regarding its hardness and surface texture, in particular of polycarbonate or another plastic.

27. The nozzle piece according to one of claims 1 - 26,  
**characterized in that**  
a scale and/or a color partitioning for marking the position  
of the nozzle openings relative to the main axis of the hand  
piece is provided on the tube-shaped partial length of the  
nozzle piece.

28. The nozzle piece according to one of claims 1 - 27,  
**characterized in that**  
the tube is composed of a single-use product exchangeably  
mounted on the grip.

29. The nozzle piece according to one of claims 1 - 28,  
**characterized in that**  
the tube is held by a holding piece which is rotatable rela-  
tive to the grip.

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